SECOND PART. SYSTEMS OF ELECTRIFIED AIRCRAFT ACTUATOR MECHANISMS

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Card 11/11

Kulebakin, V.S.

8(2); 28(1) PHASE I BOOK EXPLOITATION SOV/1433

Soveshchaniye po avtomatizirovannomu elektroprivodu peremennogo toka, Moscow, 1955

Trudy... (Transactions of the Conference on Automated A-C Electric Drives) Moscow, Izd-vo AN SSSR, 1958. 398 p. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

Resp. Eds: V.S. Kulebakin, Academician, and M.G. Chilikin, Doctor of Technical Sciences, Professor; Ed. of Publishing House: D.M. Ioffe; Tech. Ed.: I.F. Kuz'min.

COVERAGE: The conference was organized on the initiative of the Institute of Automation and Telemechanics of the Academy of Sciences, USSR, and the Moscow Power Engineering Institute and had as its aim the planning of the most progressive ways of developing automatic control of electric drives. The first conference on the subject of automated electric drive took place more than ten years before the present one and was concerned with d-c electric drives. The results of this conference were found to be most valuable in the task of rebuilding postwar Soviet industry and in furthering industrial development. Present technical development of Soviet industry demands high speeds, simplicity of construction, reliability of operation, and economy. The squirrel-cage induction motor with frequency control appears to be the most promising type of controlled a-c drive. For wide application of this drive in the Soviet economy there is a need of developing new types of frequency converters. Some interesting studies were made in this connection at the Institute of Automation and Telemechanics of the USSR Academy of Sciences and its Leningrad branch, at the Moscow Power Engineering Institute, the Central Design Bureau of the "Elektroprivod Plant, the State Design Institute of the Ministry of Construction of the RSFSR, and in other design organizations. These studies were discussed at the present conference. The transactions contain material concerning the theory and design of reactor, pulse, and frequency methods of controlling a-c electric drives. Candidate of Technical Sciences I.V. Utkin and Engineer V.A. Kokoreva participated in the preparation of this collection of papers. The volume was reviewed by Professor Ya. V. Mitusov, Doctor of Technical Sciences. Some of the papers include a bibliography.

TABLE OF CONTENTS:

This is a survey article of recent developments and research work in this field in the USSR. The author briefly presents the work which several scientific research institutes and individual scientists and engineers are presently doing and discusses individual achievements. There are no references.

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APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000927410007-1"

KULEBAKIN, V.S., otv.red.

[Lighting handbook] Spravochnik po svetotekhnike. Vol.2. [Principles of lighting and lighting equipment] Osnovy svetotekhniki i osvetitel'nye ustanovki. Moskva, Izd-vo Akademii nauk SSSR, 1958. (MIRA 12:11)

1. Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk. (Lighting)

KULEBAKIN, V.S.

KULEBAKIN, V.S., akademik, otv.red.; YEFANESHNIKOV, M.M., red.izd-va; SHEVCHENKO, G.N., tekhn.red.

[Manual on lighting engineering] Spravochnaia kniga po svetotekhnike. Vol.2 [Principles of lighting engineering and lighting fixtures] Osnovy svetotekhniki i osvetitel'nye ustanovki. Moskva, 1958. 454 p. (MIRA 12:2)

(Lighting)

PHASE I BOOK EXPLOITATION POL/3440

Kulebakin, Viktor Sergeyevich, V. Morozovskiy, and I. Sindeyev

Lotnicze elektroenergetyczne urządzenia pokładowe (Electrical Equipment for Aircraft) Warszawa, Wyd-wo Min-wa obrony narodowej, 1958. 546 p. Errata slip inserted. 600 copies printed.

Eds.: Maria Kowalska, Master in Engineering, and Jerzy Domański, Engineer; Tech. Ed.: Helena Malczewska; Leslaw Będkowski, Master in Engineering; Józef Kruś, Master in Engineering, and Janusz Dombrowicki, Engineer; Reviewer: Józef Sienkiewicz, Master in Engineering.

PURPOSE: This book is a textbook for students and aircraft engineers and technicians.

COVERAGE: The book describes the design and operating principles of basic modern electrical power equipment of aircraft. It discusses theoretical principles of various operating processes

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Electrical Equipment (Cont.)

of individual units and of the system as a whole. The book also describes the construction of electric power systems and lists technical requirements of the most widely used kinds of equipment. There are 43 references: 36 Soviet and 7 English.

TABLE OF CONTENTS:

Electrical Equipment (Cont.) POL/3440

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GEYLER, Leonid Benediktovich, prof., doktor tekhn. nauk; KULEBAKIN, V.S., retsenzent; MAR'YANOVSKIY, D.I., kand. tekhn. nauk, retsenzent; GRUSHEVSKAYA, G.M., red. izd-va; EL'KIND, V.D., tekhn. red.

[Electric driving in the manufacture of heavy machines] Elektroprivod v tiazhelom mashinostroenii. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958. 586 p. (MIRA 11:10)
(Electric driving)

KULEBAKIN, V. S.

AUTHOR: Kulebakin, V. S. (Moscow). 24-2-11/28

TITLE: On the use of semi-conductor rectifiers in systems of automated electric drives. (O primenenii poluprovodnikovykh vypryamiteley v sistemakh avtomatizirovannogo elektroprivoda).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, No.2, pp. 87-103 (USSR).

ABSTRACT: This paper was read at the Scientific Meeting of the Technical Sciences Section, Ac.Sc. USSR devoted to the 40th anniversary of the October revolution. The main advantage of germanium and silicon rectifiers is their high efficiency, small dimensions and weight and simplicity of operation. On the other hand, their overload capacity is somewhat limited, in the case of series connection of several cells the distribution of the back voltage is non-uniform and germanium rectifiers are sensitive to thermal effects and short duration over-voltages. In this paper the results are described of theoretical and experimental investigations of several systems of d.c. and a.c. drives in which germanium rectifiers are used for rectifying the voltage and the speed control is effected by means of saturation chokes (magnetic amplifiers).

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On the use of semi-conductor rectifiers in systems of automated electric drives.

First, the author considers typical circuits for regulating the r.p.m. of d.c. drives fed by means of rectified current, using magnetic amplifiers. Then, he deals with control characteristics and presents a graphical method of calculation of the fundamental control parameters. Then he deals with extending the range of changes of the voltage at the terminals of d.c. motors. According to earlier work of the author, the range of variation of the speed and stable operation for all speeds, both under load and in the no-load condition, can be achieved if the magnetic amplifiers are switched into the circuit not only in series with the main circuit but also parallel to the a.c. terminals of the rectifying equipment when using d.c. motors. The proposed circuit for starting and speed control of d.c. motors with magnetic amplifiers is shown in Fig.16 for motors with independent excitation as well as for motors with series excitation and current supply from the a.c. system via the rectifiers. The described controls were investigated experimentally using a circuit as shown in Fig.17. Single-phase 50 c.p.s. current was rectified by

On the use of semi-conductor rectifiers in systems of automated electric drives.

means of bridge connected germanium rectifiers; each branch of the bridge consisted of series connected elements designed for a nominal voltage of 15 A and a d.c. motor of 120 V, 15 A, 1500 r.p.m. A photograph of the metering stand for these experiments is reproduced in Fig.18, p.97. The basic control characteristics of the saturation chokes are graphed in Fig.19, whilst the main characteristics of an electric drive, using a motor with independent excitation, are graphed in Figs.20-22. The author also deals with choke regulation of asynchronous motors mentioning the drawbacks of a system described by Alger, P.A. (Ref.8) and describing a system which he himself proposes, which is based on frequency transformation. The system consists of the following basic elements: a rotary convertor or a single armature cascade convertor; semi-conductor, electron-ion or mechnical rectifying equipment; equipment for regulating the voltage fed to the rectifiers and for this purpose saturation chokes with controllable premagnetisation, auto-transformers with continuous or step-wise voltage switching, pre-magnetised transformers, rotatable

On the use of semi-conductor rectifiers in systems of automated electric drives.

transformers, potential regulators and others can be used. If electron-ion or semi-conductor rectifiers are used, the regulating and the rectifying equipment can be combined in a single unit. Fig.26 shows diagrammatically the system of an a.c. electric drive in which the starting and speed control is effected by changing the frequency and the voltage. A single core convertor is first started with a reduced voltage as a d.c. motor with independent excitation; during rotation of the armature a.c. current is obtained on the slip rings, the intensity of which is proportional to the speed of rotation of the armature and the number of pole pairs of the machine. By regulating the voltage of the rectifying equipment and the current in the excitation circuit, it is easily possible to establish such values of the voltage and frequency at the a.c. side which are the most favourable for starting asynchronous or synchronous a.c. motors. By gradually increasing the voltage of the rectifying equipment, the r.p.m. of the motors is brought up to the desired value. The described system is applicable for simultaneous control of the speed of several motors and also for establishing synchronous

On the use of semi-conductor rectifiers in systems of automated electric drives.

running of several motors since in this case it is possible to use solely a single frequency transformer. The here described system is applicable for electric locomotives with single-phase current supply and also for diesel-electric and other traction purposes. The experimentally obtained results of such a frequency control of the speed of asynchronous motors, obtained in the laboratory of the IAT Ac.Sc. USSR by A. A. Yanshin, are graphed in Figs.28 and 29 showing the electro-mechanical characteristic of the asynchronous motor in the case of frequency regulation and of the dependence on the load of the current intensity of the asynchronous motor at various rotation speeds. The influence of the back couplings on the static and dynamic behaviour of the saturation chokes is also discussed. The obtained results lead to the recommendation of using extensively saturation chokes and rectifiers, particularly germanium and silicon rectifiers, in the regulating systems of electric drives. Acknowledgments are made to V. V. Filosofov of VVIA imeni N. Ye. Zhukovskiy and to V. B. Stechkina, G. Ye. Ioel'son-Grodzyanska and A. A. Yanshin of the IAT, Ac.Sc. USSR

On the use of semi-conductor rectifiers in systems of automated electric drives.

Laboratory for their participation in the experiments. There are 29 figures and 10 references - 6 Russian, 4 English.

SUBMITTED: November 22, 1957.

AVAILABLE: Library of Congress.

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SOV/24-58-11-6/42

AUTHORS: Arkhangel'skiy, A. A. and Kulebakin, V. S.

TITLE: Academician A. N. Tupolev, on the occasion of his 70th birthday

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 11, pp 4-6 (USSR)

ABSTRACT: Tupolev ended his studies on aviation in 1918. He took a very active part in organising the Central Aero-Hydrodynamic Institute (TsAGI), which was created in 1918 on the initiative of N. Ye. Zhukovskiy. It was in this Institute that the entire scientific activity in the aviation field was concentrated in the Soviet Union between 1923 and 1940. This Institute was also responsible for training strong teams of scientists who are at present occupying leading positions in almost all the Soviet aviation research institutes. The type designations, mostly prewar, of the aircraft are briefly enumerated which were developed with the direct co-operation or under the guidance of Tupolev. The Tu-104 developed in 1955 is claimed to be one of the best passenger jet aircraft at present available; its cruising speed is 800 km/hr and due to the fact that the cabin

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Academician A. N. Tupolev, on the Occasion of his 70th Birthday

is pressurized it can fly at an altitude of 10 000 m. A modification of this is the Tu-110 which has four engines instead of the two of the Tu-104 and has a carrying capacity of 100 to 120 passengers. The most recent type in this series is the Tu-114. The aircraft Tu-104 and Tu-114 carry modern means of navigation, radio navigation and automatic pilots so that the aircraft can fly at any time of the day or night. Tupolev has contributed greatly to aviation science. he developed the fundamentals of aerodynamic calculation of an aircraft, the theory of stressing, etc. In addition to designing aircraft, A. N. Tupolev has designed a number of types of naval torpedo launches. Tupolev became an active member of the Ac.Sc. USSR in 1953. He has been awarded the Lenin Order, the Suvorov Second Degree Order, two Red Banner Orders. the Order of the Red Star, several Stalin Prizes and others.

KULEBAKIN, V.S.

PHASE I BOOK EXPLOITATION SOV/4526

Soveshchaniye po teorii invariantnosti i yeye primeneniyu v avtomaticheskikh ustroystvakh. Kiyev, 1958

Teoriya invariantnosti i yeye primeneniye v avtomaticheskikh ustroystvakh; trudy soveshchaniya (Theory of Invariance and Its Applications to Automatic Devices; Transactions of the Conference Oct. 16-20, 1958) Moscow, 1959. 381 p. No. of copies printed not given.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Otdeleniye tekhnicheskikh nauk.

Resp. Ed.: V.S. Kulebakin, Academician; Editorial Commission: V.A. Bodner, Doctor of Technical Sciences, A.G. Ivakhnenko, Doctor of Technical Sciences, A.Yu. Ishlinskiy, Academician, Academy of Sciences UkrSSR, N.A. Kachanova, Candidate of Technical Sciences, P.I. Kuznetsov, Doctor of Physics and Mathematics, A.I. Kukhtenko, Doctor of Technical Sciences, B.N. Petrov, Corresponding Member, Academy of Sciences USSR, Ye.P. Popov, Doctor of Technical Sciences, G.M. Ulanov, Doctor of Technical Sciences, K.K. Khrenov, Academician, Academy of Sciences UkrSSR, P.I. Chinayev, Candidate of Technical Sciences, and N.M. Chumakov, Candidate of Technical Sciences; Tech. Ed.: G.V. Kruglov.

PURPOSE: This collection of papers is intended for engineers and other specialists working in various fields of automation.

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Theory of Invariance (Cont.) SOV/4526

COVERAGE: The collection includes reports and papers presented at the Conference on the Theory of Invariance and Its Applications to Automatic Devices which was called by the Otdeleniye tekhnicheskikh nauk (Department of Technical Sciences) and the Institut elektrotekhniki (Institute of Electrical Engineering) of the Academy of Sciences of the Ukraine and convened in Kiyev October 16 - 20, 1958. The papers presented are concerned with high-quality automatic control systems designed on the basis of compensating for the effects of disturbances or maintaining the invariance of the quality to be regulated with respect to the disturbances acting on the system. The reports treat the physical and mathematical foundations of invariance in automatic control systems, they also consider methods for designing and calculating invariant systems and problems connected with specific cases of practical applications of compensation in various automatic systems. On the basis of these reports it was established by the Conference that, by utilization of the conditions of compensation and the principle of invariance, it is possible to produce automatic systems and various arrangements which are more perfect from the viewpoint of quality of the regulation and control process, stability, simplicity of construction, and reliability of operation. The following members of the Kiyev Seminar on Automatic Control are mentioned as organizers of the conference: ..I. Kukhtenko, A.G. Ivankhenko, Yu.G. Gurnilov, O.M. Kryzhanovskiy, N.M. Chumachenko, N.A. Kachanova, and P.I. Chinayev. References accompany each article.

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Theory of Invariance (Cont.) 326

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SOV/24-59-1-2/35

AUTHOR: Kulebakin, V.S., and Yanshin, A.A. (Moscow)

TITLE: Basic Features of Frequency Regulation of Alternating Electric Drives by Means of a Single Armature Converter (Osnovnyye svoystva chastotnogo regulirovaniya elektroprivodov peremennogo toka s primeneniyem odnoyakornogo preobrazovatelya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, Energetika i Avtomatika, 1959, Nr 1, pp 11-19 (USSR)

ABSTRACT: The paper describes the continuation of the authors' previous work (Ref 1 and 2). The equipment consists of a single-armature frequency converter (1, Fig 1), a rectifier (2), a voltage regulator(3) and three asynchronous short-circuited motors (4). The single armature converter starts as a constant current motor with independent excitation. On rotation of the armature, the converter is subjected to a voltage of frequency proportional to the velocity of rotation and to the number of pairs of poles. This implies that the arrangement fulfils the optimum law for regulating the velocity of asynchronous short-circuited motors (Ref 3) over a wide range of frequencies and torques. A variant

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Basic Features of Frequency Regulation of Alternating Electric Drives by Means of a Single Armature Converter

of the basic scheme, shown in Fig 2, was tested experimentally and achieved stable regulation between 0.6 and 70 c/s. The behaviour of the system in starting, stopping and reversing is displayed graphically (Fig 6-8). It is also possible to apply the system to synchronous motors. There are 8 figures and 5 Soviet references.

ASSOCIATION: Laboratoriya Avtomatizirovannogo Elektroprivoda IAT AN SSSR (Laboratory for Automation of Electric Drive IAT, AS USSR)

SUBMITTED: 14th July 1958

AUTHOR: Kulebakin, V.S. (Moscow) SOV/24-59-4-2/33

TITLE: Scientific-technical Problems of Automatic Electrical Drive - The Energy Basis for the Mechanisation of Production Processes

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1959, Nr 4, pp 5-10 (USSR)

ABSTRACT: This is a very general article on the advantages of automation and of the problems that the development of automation raises in electrical engineering.
Mechanisation and automation are still rather backward and must be developed rapidly. This closely affects electrical engineering because a very large part of the electric power generated is converted into mechanical power for use in industry. An important characteristic of modern electric drives is thorough adaptation of the electrical part of the drive to the working parts of the machines driven, so that the actual machines can be greatly simplified. Examples of this include machine tools for electrical copying, reversing and continuous rolling-mill drives, paper-making machinery and so on. In this type of applicatio

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the simultaneous control of a large number of motors is important.

The development of flow methods of production makes new requirements of automatic systems. For example, in automatic production lines the motion of the individual parts must be carefully correlated. It is also becoming necessary to introduce into electric-drives, computers, program control, and control by magnetic recordings or special machines. A good deal of theoretical and experimental investigations and equipment development are required on these problems. Automatic drives must be reliable and, therefore, simple. It will be necessary to increase the range of electrical equipment manufacured and to improve its quality. In particular, the properties of various kinds of motors, high-speed amplifiers, rectifiers and inverters and relays and contactors must all be improved. The reliability of automatic systems can be improved by the use of contactless devices of various kinds.

 Because of the immense scale of electrification any gain

Scientific-technical Problems of Automatic Electrical Drive - The Energy Basis for the Mechanisation of Production Processes

in efficiency has considerable economic consequences and so has reduction in the weight of machines, which is in many cases very necessary. A good deal of work remains to be done on the development of machines for use in inaccessible locations, as in atomic power stations. A discussion then follows of the relative merits of direct-current and alternating-current motors for various types of automatic drive with general indications of the lines of development that favour the use of one or other type of motor. The use of simple and cheap AC induction motors will be facilitated by the development of simple and economic frequency changers, which may result from the development and production of power semiconductor rectifiers. High-speed high-frequency AC motors have special advantages in particular cases.

In the USSR, many electrified installations are provided with their own generator and the combined design of prime mover, generator and drive raises many important problems.

 There is a need to develop electrical drives for

Scientific-technical Problems of Automatic Electrical Drive - The Energy Basis for the Mechanisation of Production Processes

reciprocating and vibrating motions, for example, no satisfactory electrical drive for such machines as steam hammers has yet been developed. Many other important problems await solution.

8 (0)

AUTHORS: Kostenko, M. P., Kulebakin, V. S., Trapeznikov, V. A., Venikov, V. A., Goloban, A. T., Morozov, D. P., Syromyatnikov, I. A. Drozdov, N. G., Petrov, I. I., Basharin, A. V., Sokolov, M. M., and others

SOV/105-59-11-27/32

TITLE: Professor M. G. Chilikin. On His 50th Birthday and His 25th Year of Scientific, Engineering, and Pedagogical Activity

PERIODICAL: Elektrichestvo, 1959, Nr 11, p 91 (USSR)

ABSTRACT: Professor Mikhail Grigor'yevich Chilikin is Director of the Moskovskiy ordena Lenina energeticheskiy Institut (Moscow Order of Lenin Institute of Power Engineering) and a specialist in the field of electric drive. Professor M. G. Chilikin wrote his dissertation for his application as Candidate of Technical Sciences in 1938, in 1951 he was appointed professor and in 1954 he obtained the degree of a Doctor of Technical Sciences. Since 1951 he has taught at the Kafedra "Elektrooborudovaniye promyshlennykh predpriyatiy" (Chair for Electrical Equipment of Industrial Enterprises) of MEI. He held lectures on electric drives and dealt with the construction of electric drive systems. In 1952 he became head of the aforementioned institute. He issued ninety papers on teaching

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methods in universities, on scientific problems of electric drives and electrification. His books are well known among workers and university students. M. G. Chilikin is President of the Nauchno-tekhnicheskiy komitet po avtomatizirovannomu elektroprivodu i primeneniyu elektricheskikh mashin (Scientific and Technical Committee for Automated Electric Drives and the Use of Electrical Machines), President of the sektsiya energo-vooruzheniya Tekhsoveta Gosplana SSSR (Section for the Energy Equipment of the Technical Council of the Gosplan USSR), Member of the Editorial Council of the Gosenergoizdat (State Power Engineering Publishing House), Member of the Board of Editors of the periodical "Elektrichestvo". He was a member of the Plenum of a rayon Committee of the CPSU, and four times delegate in the Mossovet (Moscow Soviet). He received the Order of the Red Banner of Labor and other awards. There is 1 figure.

KULEBAKIN, V.S.

8(0)
SOV/105-59-12-20/24

AUTHORS: Alekseyev, A. A., Bogoroditskiy, N. P., Glebov, I. A., Dezho, A. R., Drozdov, N. G., Kapitsa, P. L., Kulebakin, V.S., Neyman, L. R., Syromyatnikov, I. A., et al

TITLE: Academician M. P. Kostenko. On His 70th Birthday and the 40th Anniversary of His Scientific and Pedagogic Activity

PERIODICAL: Elektrichestvo, 1959, Nr 12, pp 81 - 82 (USSR)

ABSTRACT: The oldest member of the editorial staff of the periodical "Elektrichestvo", Mikhail Polyevktovich Kostenko was born the son of a physician in the District Voronezh in 1889. He studied at the Peterburgskiy universitet (St. Peterburg University) in 1907, in 1909 at the Peterburgskiy elektrotekhnicheskiy institut (St. Peterburg Institute of Electrical Engineering) was relegated in 1910, because of participation in a students' revolt and exiled to the Perm' District. 1911 - 1913 he worked there as a telephone mechanic. 1913-1918 he studied and graduated from the Peterburgskiy politekhnicheskiy institut (St. Peterburg Polytechnic Institute). In 1920 he was elected instructor for the Chair of electrical Machines at the same institute. 1922 - 1924 Kostenko was sent

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to England as an engineer and made several inventions (pulse generator, commutator generator etc.). He again started working at the Leningradskiy politekhnicheskiy institut im. Kalinina (Leningrad Polytechnic Institute imeni Kalinin) in 1924, where he became docent in 1927, and professor and head of the Chair of Electrical Machines in 1930. Since 1924 he also worked at the "Elektrosila" Works as an engineer. He took part in the development of the new turbogenerator series from 1927 to 1930. His book "AC-Commutators" appeared in 1933. In 1935 - 1936 he worked as chief electrical engineer at the Khar'kovskiy elektromekhanicheskiy zavod (Khar'kov Electromechanical Plant). He then returned to the Leningrad Polytechnic Institute. In 1939 he was elected Corresponding Member of the AS USSR. Subsequently he worked in the Komissiya otdeleniya tekhnicheskikh nauk AN SSSR po vyboru sistemy toka dlya elektrifikatsii zheleznykh dorog SSSR (Commission of the Department of Technical Sciences of the AS USSR for the current type selection for the electrification of railroads in the USSR). 1942-1944 a large-size mercury rectifier plant was installed within the system of the Uzbekenergo under

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his supervision. This work served as basis for the book published in 1946 together with L. R. Neyman and G. N. Blavdzievich "Elektromagnitnyye protsessy v sistemakh s moshchnymi vypryamitel'nymi ustanovkami" (Electromagnetic Processes in Systems With Large-size Rectifier Installations). During the same time and under his supervision, the simulation of large power systems by means of special machines was developed. He returned to the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute) in 1944. In 1950 he received the Lenin prize. He is member of the GNTK at the Sovet Ministrov SSSR (Council of Ministers, USSR), member of the technical council at the "Elektrosila" Plant and at the Institut postoyannogo toka (D.C.-Institute), delegate of the Verkhovnyy Sovet SSSR (Supreme Soviet of the USSR), member of the Presidium of the AS USSR and its representative in Leningrad. There is 1 figure.

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KULEBAKIN, V.

Main tasks and methods for improving the quality of automatic regulatory systems. p. 343.

MAGYAR TUDOMANYOS AKADEMIA. MUSZAKI TUDOMANYOK OSZTALYA. KOZLEMENYEI. Budapest, Hungary. Vol. 24, no. 1/4, 1959.

Monthly List of East European Accessions. (EEAI) LC Vol. 9, no. 2, Feb. 1960 Uncl.

KULEBAKIN, V. S.

"The Theory of Invariability of Automatically Regulated and Controlled Systems."

Paper presented at the First International Congress of the International Federation on Automatic Control (IFAC), Moscow, 27 Jun-7 July 1960.

MALOV, Vladimir Sergeyevich; ZHUKHOVITSKIY, B.Ya., red.; ANTIK, I.V., red.; VESHNEVSKIY, S.N., red.; KULEBAKIN, V.S., red.; SMIRNOV, A.D., red.; SOTSKOV, B.S., red.; STEFANI, Ye.P., red.; SHUMILOVSKIY, N.N., red.; VORONICH, K.P., tekhn.red.

[Remote control] Telemekhanika. Moskva, Gos.energ.izd-vo, 1960. 93 p. (Biblioteka po avtomatike, no.13)

(MIRA 14:3)

(Remote control)

IL'IN, Viktor Aleksandrovich; KUZNETSOV, N.A., red.; ANTIK, I.V., red.; VESHENEVSKIY, S.I., red.; KULEBAKIN, V.S., red.; SMIRNOV, A.D., red.; SOTSKOV, B.S., red.; STEFANI, Ye.P., red.; SHUMILOVSKIY, N.N., red.; LARIONOV, G.Ye., tekhn.red.

[Remote-control systems for widely-separated objects] Sistemy telemekhaniki dlia rassredotochennykh ob"ektov. Moskva, Gos. energ.izd-vo, 1960. 110 p. (Biblioteka po avtomatike, no.15). (MIRA 14:3)

(Remote control)

VOLOSNIKOV, Vladimir Petrovich; SIROTIN, A.A., kand.tekhn.nauk, red.; ANTIK, I.V., red.; VESHNEVSKIY, S.I., red.; KULEBAKIN, V.S., red.; SMIRNOV, A.D., red.; SOTSKOV, V.S., red.; STEFANI, Ye.P., red.; SHUMILOVSKIY, N.N., red.; BORUNOV, N.I., tekhn.red.

[Use of computers for automating electric drives] Ispol'zovanie vychislitel'nykh mashin dlia avtomatizatsii elektroprivodov. Moskva, Gos.energ.izd-vo, 1960. 119 p. (Biblioteka po avtomatike, no.17). (MIRA 14:3)
(Automatic control) (Electronic calculating machines)
(Electric driving)

BONDARENKO, Prokofiy Stepanovich; BYCHKOV, V.P., red.; ANTIK, I.V., red.; VESHENEVSKIY, S.P., red.; KULEBAKIN, V.S., red.; SMIRNOV, A.D., red.; SOTSKOV, B.S., red.; STEFANI, Ye.P., red.; SHUMILOVSKIY, N.N., red.; BYCHKOV, V.P., red.; VORONIN, K.P., tekhn.red.

[Automatic control of blast-furnace processes by means of computers] Avtomatizatsiia protsessov domennogo proizvodstva s primeneniem schetno-reshaiushchikh ustroistv. Moskva, Gos. energ.izd-vo, 1960. 143 p. (Biblioteka po avtomatike, no.20) (MIRA 14:3)

(Blast furnaces) (Automation)

VOROB'YEVA, Tamara Mikhaylovna; ANTIK, I.V., red.; VESHNEVSKIY, S.N., red.; KULEBAKIN, V.S., red.; SHIRNOV, A.D., red.; SOTSKOV, B.S., red.; STEFANI, Ye.P., red.; SHUMILOVSKIY, N.N., red.; KUZNETSOV, N.A., red.; LARIONOV, G.Ye., tekhn. red.

[Electromagnetic clutches] Elektromagnitnye mufty. Moskva, Gos. energ. izd-vo, 1960. 206 p. (Biblioteka po avtomatike, no.18) (MIRA 14:5)

1. Chlen korrespondent AN SSSR (for Sotkov)
(Clutches (Machinery)) (Electric controllers)

YEGOROV, K.D., kand.ekon.nauk; TROSHINA, A.P.; KOVALEV, P.P.; NOVIKOVA, A.A.; LAGUTINA, M.V.; VOLNINA, N.A.; SHESTAKOVA, R.V.; AKIMCHENKO, O.Ye.; KULEBAKIN, V.S., akademik, red.; VEYTS, V.I., red.; BUTENKO, A.F., kand.filosof.nauk, red.; RYBINSKIY, M.I., red.; CHASHNIKOVA, M.V., red.; NIZHNYAYA, S., red.; VOSKRESENSKAYA, T., red.; CHEKHUTOVA, V., red.; REKLITSKAYA, A.D., red.; CHEPELEVA, O., tekhn.red.

[Works of the State Commission for the Electrification of Russia; documents and materials] Trudy Gosudarstvennoi komissii po elektrifikatsii Rossii GOELRO; dokumenty i materialy. Red.komissiia: V.S.Kulebakin and others. Moskva, Izd-vo sotsial'no-ekon.lit-ry, 1960. 306 p. (MIRA 14:2)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennaya komissiya po elektrifikatsii Rossii. 2. Chlen-korrespondent AN SSSR (for Veyts). (Electrification)

PHASE I BOOK EXPLOITATION SOV/4116

Kulebakin, Viktor Sergeyevich, Igor' Mikhaylovich Sindeyev, Pavel Davidovich Davidov, and Boris Fedorovich Fedorov (Deceased)

Elektricheskiye sistemy zazhiganiya, obogreva i osveshcheniya samoletov (Electric Ignition, Heating, and Lighting Systems for Aircraft) Moscow, Oborongiz, 1960. 372 p. (Series: Elektrifikatsiya samoletov) Errata slip inserted. 5,500 copies printed.

Reviewers: Moscow Aviation Institute; D.A. Zavalishin, Honored Scientist and Technologist for the RSFSR, Doctor of Technical Sciences, Professor; Ed.: A. M. Senkevich, Candidate of Technical Sciences, Docent; Managing Ed.: S. D. Krasil'nikov, Engineer; Ed. of Publishing House: P. B. Morozova; Tech. Ed.: V. I. Creshkina.

PURPOSE: This is a textbook for aeronautical schools of higher education.

COVERAGE: The book contains a description of the operating principles and structure of electrical systems for ignition of combustible mixtures in piston engines, gas turbines, and jet engines; for heating the plane's crew compartment and various kinds of equipment; and for aircraft illumination and signal lights. Fundamentals of the theory

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of operating processes and computational methods are explained. Facts on the characteristics of design and operation of the heating systems are given. Part I was written by V. S. Kulebakin and I. M. Sindeyev, Part II by V. S. Kulebakin and P. D. Davidov, and Part III by B. F. Fedorov. There are 27 references: 25 Soviet and 2 English.

TABLE OF CONTENTS:

Kulebakin, V.S.

PHASE I BOOK EXPLOITATION SOV/4946

Mikhaylov, A. A., ed.

Stantsii v kosmose; sbornik statey (Space Stations; Collection of Articles) Moscow, Izd-vo AN SSSR, 1960. 444 p. 25,000 copies printed. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya Seriya)

Resp. Ed.: A. A. Mikhaylov; Compiler: V. V. Fedorov; Ed. of Publishing House: Ye. M. Klyaus; Tech. Ed.: I. D. Novichkova.

PURPOSE: This book is intended both for the space specialist and the average reader interested in space problems.

COVERAGE: The book contains 73 short articles by various Soviet authors on problems connected with space travel and the launching of artificial earth satellites and space rockets. Some possibilities of future developments are also discussed. The articles were published in the period of 1957-1960. No personalities are mentioned. There are no references.

IV. UNPRECEDENTED FEAT OF SOVIET SCIENCE

V. SPACE SHIPS

ANL ? BAKIN, K. S.

report to be presented at the 1st Intl Congress of the Intl Federation of Automatic Control, 25 Jun-5 Jul 1960, Moscow, USSR.

BYKHOVSKIY, M. L. - "Ultra stability in electronic calculating devices in the solution of nonlinear equations in indefinite form"
CHELYUSTKIN, A. B. - "Use of calculating devices in systems for the automatic control of rolling mills"
CHICHINADZE, V. K. - "Concerning some problems of the organization of self-adjusting and self-teaching systems of automatic control, based on principles of random search"
DAVYDOV, E. I. - "Development of automatic control systems for boiler units"
DUDNIKOV, Ye. G. - "Determination of optimum adjustments of industrial automatic regulation systems according to initial data obtained from experience"
DUB'YE, A. I., and ROZENVASSER, E. N. - "Methods of organizing Lyapunov functions in the theory of nonlinear regulating systems"
DRUZHININ, N. N. - "Balanced regulation and inter-communications of a multi-motor electric drive and technology in continuous rolling mills"
FEL'DBAUM, A. A. - "Problems of statistical theory of automatic optimization systems"
FEYGIN, V. I. - "Automation of a reversible cold rolling mill for nonferrous metals"
FILIPPOV, A. F. - "Application of the theory of differential equations with a discontinuous right side to nonlinear problems of automatic regulation"
GAVRILOV, M.A. - "Structural surplus and operational reliability of relay devices"
GANKIN, M. Z. - "Automation of irrigation systems"
GERTSENBERG, G. R., KASHTELYAN, V. E., KOSTENKO, M. P., KUCHAN, L. R., and SIRYY, N. S. - "Power regulation of disturbance and problems of the stability of electric power systems"
GINZBURG, S. A. - "Logical method of synthesis of functional converters"
IL'IN, V. A. - "Methods of transmission of information and the structure of telemechanical systems for dispersed structures"
INOSOV, V. L., and LUTSKIY (fnu) - "The code-impulse system of telemeasurement for dispatched operations of trunk-line gas pipe lines"
IVAKHNENKO, A.G. - "Concerning the application of the theory of combined regulation systems for cybernetic adaptation systems"
KARANDEYEV, K. B., and SHTAMBERGER, G. A. - "A quasi-equilibrated bridge as an element in a system of automatic control"
KAZAKEVICH, V. V. - "Concerning the process of extra regulation of inert objects in the presence of disturbance"
KAZAKOV, I. E. - "Some problems of the theory of statistical linearization and its application"
KILIN, F. M. - "Some problems of the theory of impulse systems with time selectors"
KOBRINSKIY, A. E., BOLKHOVITIN, S. V., VOSKOBOYNIKOV, L.M., IOFFE, D. M., POLYAN, E. P., POPOV, B. P., SLAVUTSKIY, Ya. L., SYSIN, A. Ya., and YAKOBSON, Ya. S. - "The problem of bioelectric control"
KOLOMIYETS, B.T. - "New types of photo resistances and their field of use"
KOROBKO, M.L., MIKHYUTOV, B. C., and SUKHILOV, K. A. - "System of automatic control and regulation of blast distribution in the tuyeres of blast furnace"
KOROBOCHKIN, B. L. - "Investigation of the dynamics of the hydraulic duct of a copying lathe"
KRASOVSKIY, A. A. - "Dynamics of continuous systems of automatic regulation with extra self-adjustment of corrective devices"
KRASOVSKIY, N. N. - "Concerning the selection of parameters of optimum stability systems"
KUKHTENKO, A. I. - "The dynamics of devices imitating living organisms"
KULEBAKIN, V. S. - "The invariant theory of automatic regulation and control systems"
LANIN, I. D. - "Pneumatic calculating devices as a means of insuring the reliability of complex automation systems"
LAZAREV, V. G., and PARKHOMENKO, P.P. - "Mechanization of processes of analysis and synthesis of the structure of relay devices"

Name : KULEBAKIN, V. S.

Title : Academician, USSR Academy of Sciences /Electrical Engineering/.

Remarks : V. S. KULEBAKIN is the author of an article entitled "Automation Devices in Outer Space".

Source : M: Stantsii v Kosmose (Stations in Outer Space), a collection of articles, published by the USSR Academy of Sciences, Moskva, 1960, with foreword by Academicians A. N. Nesmeyanov and A. V. Topchiyev, p. 394.

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S/194/61/000/011/028/070
D256/D302

AUTHOR: Kulebakin, V.S.

TITLE: Methods of improving automatically functioning systems

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 40, abstract 11 V332 (V sb. Avtomatiz. mashinostroit. protsessov, v. 3, M., AN SSSR, 1960, 246-271)

TEXT: The scientific problems are formulated of investigations concerning the development of modern systems of automatic control. The methods suitable for improving the quality of the processes in automatic systems are discussed. Particular consideration is devoted to applying combined control (i.e. control by using both the initial deformation and secondary signal) and the principles of invariance. It is pointed out that the problem of investigating the static and dynamic properties of the object of regulation is at

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Methods of improving...

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present the most important one. It is necessary for functioning in real conditions that the object of regulation should have specified properties of automation concerning both its static and dynamic characteristics. 10 figures. 19 references. [Abstracter's note: Complete translation]

Card 2/2

NIKITIN, Vasiliy Petrovich, akad. [deceased]; KULEBAKIN, V.S., akad., otv. red.; GRIGOR'YEV, Ye.N., red. izd-va; DOROKHINA, I.N., tekhn. red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akad. nauk SSSR, 1961. 430 p. (MIRA 14:5)
(Electric welding) (Electric driving)

ASTASHENKOV, Petr Timofeyevich; KULEBAKIN, V.S., akademik, general-mayor, inzh.-tekhnicheskoy sluzhby, red.; KOZLOV, V.P., red.; KRASAVINA, A.M., tekhn.

[Use of electricity in airplanes and rockets] Elektrichestvo na samolete i rakete. Pod red. V.S.Kulebakina. Moskva, Voen.izd-vo M-va obor. SSSR, 1961. 140 p. (MIRA 15:1)
(Airplanes—Electric equipment)
(Rockets (Aeronautics))—Electric equipment)

TRAPEZNIKOV, V.A., akademik, glav. red.; AYZERMAN, M.A., doktor tekhn. nauk, red.; AGEYKIN, D.I., kand. tekhn. nauk, red.; ARTOBOLEVSKIY, I.I., akademik, red.; BATRACHENKO, L.P., inzh., red.; VORONOV, A.A., doktor tekhn. nauk, red.; GAVRILOV, M.A., doktor tekhn. nauk, red.; DIKUSHIN, V.I., akademik, red.; KARIBSKIY, V.V., kand. tekhn. nauk, red.; KOGAN, B.Ya., kand. tekhn. nauk, red.; KRASIVSKIY, S.P., red.; KULEBAKIN, V.S., akademik, red.; LERNER, A.Ya., doktor tekhn. nauk, red.; LETOV, A.M., kand. tekhn. nauk, red.; MEYEROV, M.V., doktor tekhn. nauk, red.; PETROV, B.N., akademik, red.; PUGACHEV, V.S., doktor tekhn. nauk, red.; SOTSKOV, B.S., red.; STEFANI, Ye.M., kand. tekhn. nauk, red.; KHRAMOY, A.V., kand. tekhn. nauk, red.; TSYPKIN, Ya.Z., doktor tekhn. nauk, prof., red.; CHELYUSTKIN, A.O., kand. tekhn. nauk, red.; CHILIKIN, M.G., doktor tekhn. nauk, red.; NAUMOV, B.N., kand. tekhn. nauk, red.; KASHINA, P.S., tekhn. red.

[Transactions of the International Federation of Automatic Control, 1st International Congress, Moscow, 1960] Trudy I Mezhdunarodnogo kongressa Mezhdunarodnoi federatsii po avtomaticheskomu upravleniiu. Moskva, Izd-vo Akad. nauk SSSR. Vol.2. [Theory of discrete systems, optimal systems, and adaptive automatic control systems] Teoriia diskretnykh, optimal'nykh i samonastraivaiushchikhsia sistem. 1961. 996 p.
(MIRA 14:9)

1. International Federation of Automatic Control, 1st International Congress, Moscow, 1960. 2. Chlen-korrespondent AN SSSR (for Sotskov)
(Automatic control)

31323
S/569/61/001/000/008/019
D274/D304

16,8000 (1103, 1329, 1132)

AUTHOR: Kulebakin, V. S. (USSR)

TITLE: Theory of invariance of automatic control systems

SOURCE: International Federation of Automatic Control. 1st Congress, Moscow, 1960. Teoriya nepreryvnykh sistem. Spetsial'nyye matematicheskiye problemy. Moscow, Izd-vo AN SSSR, 1961. Trudy, v. 1, 247-258

TEXT: The basic mathematical and physical aspects of the invariance principle are considered. For the sake of simplicity, the processes are analyzed in the linear approximation, and the controlled object (process) is characterized by two coordinates. In general, the linearized processes are described by a system of equations with constant coefficients:

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Theory of invariance...

$$F(D)\begin{Vmatrix} x \\ y \\ z \end{Vmatrix} = \begin{Vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{Vmatrix} \begin{Vmatrix} x \\ y \\ z \end{Vmatrix} = \left.\begin{matrix} b_1 f(t) \\ 0 \\ b_2 f(t) + c\psi(t) \end{matrix}\right\} \quad (1)$$

where x and z are the coordinates of the object and y—of the controller; a, b and c are linear differential operators; f(t) is the disturbance (load), $\psi(t)$—the driving function, F(D)—the principal determinant of the matrix of the system of equations which characterize system dynamics. Eq. (1) describes a so-called open-cycle closed-cycle feedback system (combined-control system), i.e., the system is controlled simultaneously by the external disturbance and by the deviation of x and z. If no external disturbance is applied to the system, the control being effected only through the feedback of x and z, then the system becomes a closed-cycle system. Such a system is described by

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Theory of invariance...

$$\left.\begin{aligned} a_{11}x + a_{12}y + a_{13}z &= b_1 f(t) \quad , \\ a_{21}x + a_{22}y + a_{23}z &= 0 \quad , \\ a_{31}x + a_{32}y + a_{33}z &= c\psi(t) \quad . \end{aligned}\right\} \qquad (2)$$

Methods for compensation of external disturbances: The solution of Eq. (1) with respect to x is expressed in general form as

$$F(D)x = X(D)f(t) + \Phi_x(D)\psi(t) \quad , \qquad (3)$$

where $X(D)$ and Φ_x are operator polynomials. In high-quality control systems, the terms of solution (3) have to satisfy certain requirements, such as the identical vanishing of $X(D)f(t)$ and $\Phi_x(D) = F(D)$. Depending on the extent to which $X(D)f(t)$ approaches zero and on which disturbing effect is compensated, the following types of invariance are distinguished: (a) complete (to within a free component); (b) absolute;

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Theory of invariance...

(c) to within ε; (d) selective; (e) to within disturbance-derivatives. Below, complete invariance (compensation) with respect to $f(t)$ and $\bar{f}(t)$ is considered in detail; the other types of invariance are only outlined. Complete invariance is characterized by $X(D) \equiv 0$. This requirement can be met in two ways: (a) by additional control by disturbances and (b) by complex feedbacks. It was shown by G. V. Shchipanov that, by appropriate choice of the differential operators a , Eq. (2) yields

$$F(D)x_{b_1} = X(D)f(t) = A_{11}f(t) = 0 ; \quad A_{11} \equiv 0 . \tag{11}$$

This is the mathematical formulation of the invariance condition which can be realized by method (b). Physically, this means that in closed-cycle systems complete compensation is possible only if the systems contain elements which respond not only to the deviation of $x(t)$, but also to the other coordinates of the object. Absolute invariance with respect to $f(t)$: The mathematical condition is $A_{11} \equiv 0$. Further, complete compensation can be used, not only for stabilization, but also for programming

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Theory of invariance...

systems and servomechanisms which have accurate program-reproducibility for any $\psi(t)$. The invariance principle can be also used for the synthesis of nonlinear systems. Conclusion: The above compensation-types, based on the principle of invariance, can be realized in practice; this was proved by numerous studies and experiments. Their use would facilitate the solution of many practical problems of automation. In the discussion which followed, V. A. Vasilenko noted that the principle of invariance could be extended to systems with variable parameters. There are 5 figures and 12 references: 11 Soviet-bloc and 1 non-Soviet-bloc.

Card 5/5

29561
S/024/61/000/005/001/009
E140/E135

16,8000 (1031, 1132, 1013)

AUTHORS: Kulebakin, V.S., and Larichev, O.I. (Moscow)

TITLE: Multi-invariance in automatic control systems

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika, no.5, 1961, 7-12

TEXT: The authors consider the invariance principle as applied to multi-parameter systems with multiple disturbances. The study is conducted on the assumption that the processes in such systems can be described with sufficient precision by systems of linear inhomogeneous differential equations. (1)

$$\|a_{ij}\|_n^1 X = F$$

where $\|a_{ij}\|_n^1$ is a matrix of differential operators with constant coefficients; X is the column vector of coordinates x_{1j}; F is the column vector of the disturbances f_i. For this system it has been proved that the condition of invariance of the

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S/024/61/000/005/001/009
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Multi-invariance in automatic control...

coordinate $X_1(t)$ with respect to the perturbation $f_1(t)$ is the identical vanishing of the adjunct A_{11} of the determinant $\|a_{ij}\|_n^1$. It is assumed that the system (1) is in the form where the number of equations is equal to the number of regulated coordinates. To obtain invariance of several coordinates with respect to a single disturbance or of a single coordinate with respect to several disturbances - termed multi-invariance - the adjuncts of several matrix elements must vanish identically, while preserving a nonvanishing value of the determinant of the matrix. The following particular problems arise. 1) How many adjuncts of elements in a single row or column of the determinant $\|a_{ij}\|_n^1$ with $a_{ij} \neq 0$ can be identically equated to 0 with $\|a_{ij}\|_n^1 \neq 0$? In other words, how many coordinates $x_i(t)$ can be made simultaneously invariant with respect to a single disturbance $f_1(t)$? 2) Can the adjuncts of the diagonal elements of the determinant $\|a_{ij}\|_n^1$ be identically equated to 0 with $\|a_{ij}\|_n^1 \neq 0$, i.e. is it possible to make simultaneously invariant all coordinates $x_i(t)$ with respect to their corresponding disturbances $f_i(t)$?

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Multi-invariance in automatic ....

3) Find the greatest number of adjuncts of arbitrarily located determinant elements which can be equated identically to zero without vanishing of the determinant itself.
The authors prove a number of theorems which give necessary conditions for the invariance of a single coordinate with respect to $n - 2$ disturbances or $n - 2$ coordinates with respect to a single disturbance, since it is possible to equate to zero $n - 2$ adjuncts of elements in a single row or column of a nonvanishing determinant. The necessary conditions for the invariance of each of the system coordinates with respect to the corresponding perturbation have been found, since it is possible to equate to zero the n adjuncts of the diagonal elements of the determinant. It is possible to equate to zero $n - 1$ adjuncts of arbitrarily located determinant elements not all in a single column or row. A determinant with nonzero elements vanishes if $n - 1$ adjuncts of the elements of a single row or column, n adjuncts not lying on a diagonal or $n + 1$ adjuncts of elements, with n elements on the diagonal, are equated to zero. The practical application of these results lies in the determination of which system
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Multi-invariance in automatic control.

parameters must be manipulated to obtain the required type of invariance. To cause a given adjunct to vanish it is sufficient to adjust a single element entering into the adjunct. Therefore, to cause m adjuncts to vanish, it is necessary to have m adjustable elements in the corresponding adjuncts. The values to be assigned to the adjusted elements are found by the solution of a set of simultaneous equations.
There are 4 Soviet-bloc references.

SUBMITTED: May 30, 1961

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29562
S/024/61/000/005/002/009
E140/E135

16.8000 (1013, 1031, 1132)
26.2195

AUTHORS: Kulebakin, V.S., and Vershinin, V.D. (Moscow)

TITLE: The invariance of servosystems with respect to several signals

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika, no.5, 1961, 25-37

TEXT: The authors consider linear automatic control systems which can be described by equations with constant coefficients with combined regulation, i.e. regulation with respect to the disturbances and the deviations. A solution of the differential equation describing the behaviour of the coordinate x_j may be represented as the sum of the following components: a free component, constituting the general solution of a homogeneous differential equation and a forced component resulting from the action on the system of a disturbance, found as a particular solution. The free component appears only in the presence of a disturbance or when the process is caused by non-zero initial conditions. In high-quality control systems it is necessary that the free component rapidly attenuate and have small absolute

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The invariance of servosystems with ...

values while the forced component should be practically zero. These requirements can be satisfied when the disturbances are either arbitrary functions of time bounded in absolute value or are prescribed functions of time. The invariance conditions may be expressed in two ways. One of these is based on the use of supplementary control with respect to the disturbances; the other in the use of compound control, i.e. the introduction of supplementary restraints with respect to other coordinates connected with the controlled object. The first method has the advantage that it does not affect the dynamic properties of the system. The authors recall from the theory of determinants that if all elements of a row or column but one vanish, all $n-1$ adjuncts of the column or row elements in which this element appears also vanish. In this case the corresponding coordinate becomes invariant with respect to all disturbances in the remaining coordinates of the system, or all $n-1$ coordinates become invariant with respect to a single disturban... The required matrix elements can be reduced to zero by the introduction of supplementary couplings. Under certain conditions th...

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The invariance of servosystems with ...

vanishing of certain adjuncts will cause the system equations to degenerate to equations of lower order. Then small variations of the system parameters may lead to violations of system stability. This situation can be treated by suitable adjustment of the elements not entering into the invariant condition. Then the system will be coarse in Andronov's sense. The methods developed in the article have been tested on the analogue computer No. 8 (EMU-8) and on a d.c. motor speed control. Typical results of the analogue computation are given in Fig. 1, where a represents a fifth order system with regulation with respect to deviations, δ the same with introduction of supplementary control with respect to perturbations, and δ the system with compensation of the disturbance. Fig. 2 gives oscillograms of a d.c. motor speed control, where a gives the results for an ordinary system with control with respect to deviation, and δ gives the system with partial invariance - the upper line in each set gives the output velocity, the middle line the armature voltage and the lower line the shaft load. The authors also consider application of the theory to servosystems in which the controlled object is required

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E140/E135

The invariance of servosystems with ...

to follow the variations of an input signal.
G.V. Shipanov and A.A. Andronov are mentioned in the article in connection with their contributions in this field.
There are 5 figures and 16 Soviet-bloc referen...

SUBMITTED: April 25, 1961

Card 4/4

KULEBAKIN, V.Sz. [Kulebakin, V.S.], akademikus

The Lenin Plan of the electrification of the Soviet Union.
Villamossag 9 no.4:81-83 Ap '61.

1. A Szovjet Akademiai Telemechanikai es Automatizalasi Kutato Intezete

KULEBAKIN, V.S. [Kulebakin, V.S.]

The Lenin plan for the electrification of the Soviet Union.
Elektrotechnika 54 no.4:145-148 Ap '61.

1. Szovjetunio Tudomanyos Akademiajanak tagja.

ORSHANSKIY, D.L., gl. red. ARUTYUNOV, K.B., red.; VORONOV, A.A., red.; KARANDEYEV, K.B., red.; KARIBSKIY, V.V., red.; KRASIVSKIY, S.P., red.; KULEBAKIN, V.S., red.; LOGINOV, L.I., red.; LUKIN, V.I., red.; MALOV, V.S., red.; PAVLENKO, V.A., red.; PETROV, B.N., red.; RAKOVSKIY, M.Ye., red.; SMAGLY, L.V., red.; SMIRNOV, A.D., red.; SOTSKOV, B.S., red.; STEFANI, Ye.P., red.; TRAPEZNIKOV, V.A., red.; TSAREVSKIY, Ye.N., red.; LEONOVA, Ye.I., tekhn. red.

[EIKA; encyclopedia of measurements, control and automation] EIKA; entsiklopediia izmerenii kontrolia i avtomatizatsii. Moskva, Gosenergoizdat. No.1. 1962. 243 p. (MIRA 16:3)

(Instruments) (Automation) (Mensuration)

KULEBAKIN, Viktor Sergeyevich; NAGORSKIY, Valentin Dmitriyevich; VOSKRESENSKIY, Yuriy Yevgen'yevich; GESSEN, L.V., red. izd-va; ASTAF'YEVA, G.A., tekhn. red.

[Semiconductors in automatic control] Poluprovodniki v avtomatike. Moskva, Izd-vo AN SSSR, 1963. 149 p. (MIRA 16:7)

(Semiconductors) (Automatic control) (Transistors)

KULEBAKIN, V.S., akademik; VENIKOV, V.A., doktor tekhn.nauk, prof.

Increase in the frequency of commercial a.c. and determination of its optimum value for furture electrification of the U.S.S.R.
Elektrichestvo no.3:9-14 Mr '63. (MIRA 16:4)
(Electric power distribution—Alternating current)(Electrification)

YEGOROV, K.D., kand. ekon. nauk; ALEKSANDROVA-ZAORSKAYA, V.V., doktor ekon. nauk, prof.; STEPANOV, P.N., doktor geogr. nauk, prof.; KULEBAKIN, V.S., akademik, red.; KRUZHILIN, G.N., red.; FEDOROV, A.G., red.; RYBINSKIY, M.I., red.; CHASHNIKOVA, M.V., red.

[Materials on the electrification of individual districts] Materialy po elektrifikatsii otdel'nykh raionov; trudy. Moskva, Izd-vo "Nauka," 1964. 299 p. (MIRA 17:4)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennaya komissiya po elektrifikatsii Rossii. 2. Chlen-korrespondent AN SSSR (for Kruzhilin).

DOGANOVSKIY, Stanislav Anatol'yevich; KULEBAKIN, V.S., akademik retsenzent; KOROLEV, N.A., kand. tekhn. nauk, red.

[Computer units in automatic control systems responsive to perturbance] Vychislitel'nye ustroistva v avtomaticheskikh sistemakh upravleniia po vozmushcheniiu. Moskva, Energiia, 1964. 311 p. (MIRA 17:12)

ACCESSION NR: AP4041394 S/0020/64/156/006/1308/1311

AUTHOR: Varshamov, R. R.; Kulebakin, V. S. (Academician)

TITLE: Concerning one theorem of the theory of polynomial reducibility

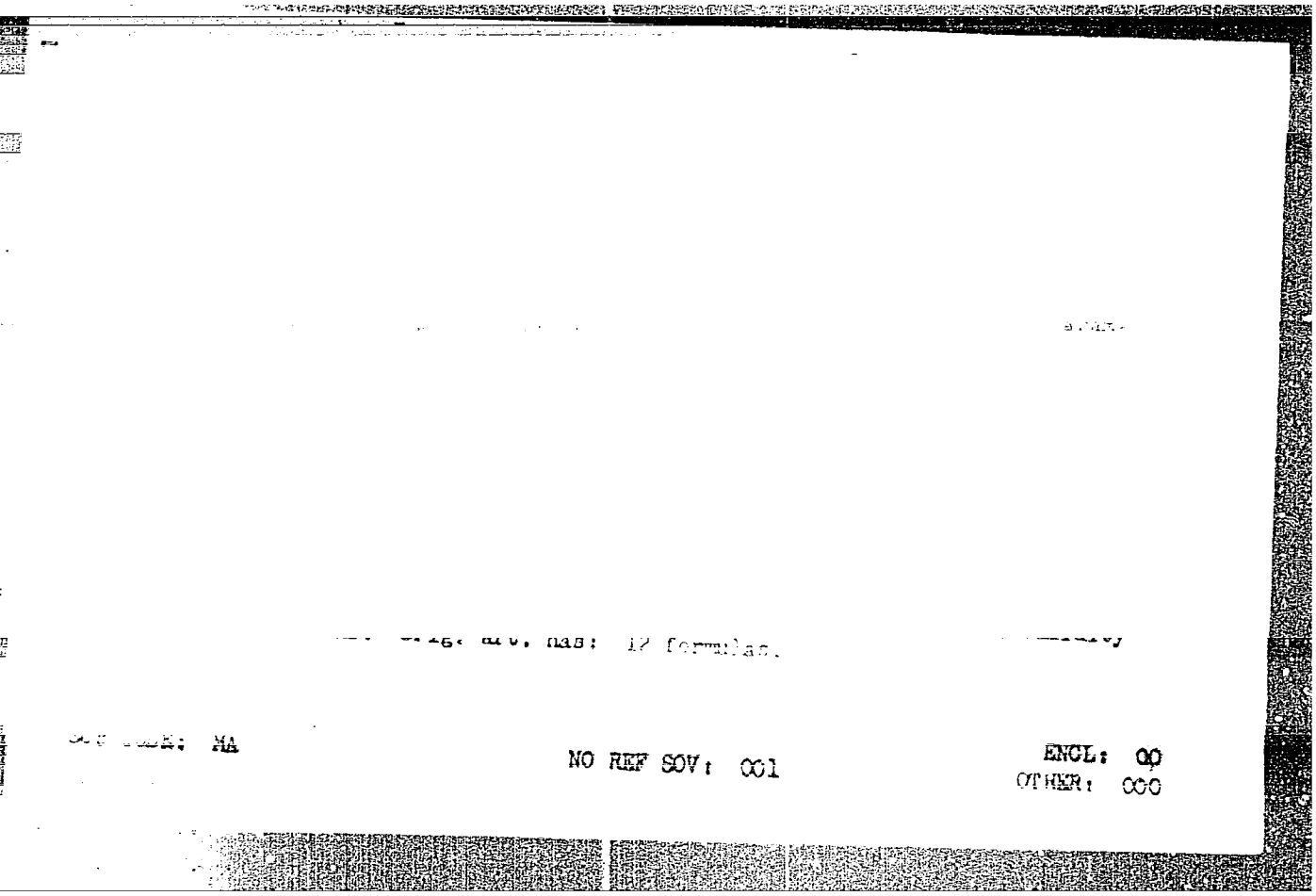
SOURCE: AN SSSR. Doklady*, v. 156, no. 6, 1964, 1308-1311

TOPIC TAGS: cybernetics, control theory, polynomial reducibility, Galois fields, irreducible polynomial

ABSTRACT: The theory of the reducibility of polynomials is essential in the modern theory of linear coding. One of its difficult and important problems is the synthesis of irreducible polynomials of a given degree. The present communication deals with this problem. Polynomials are considered with coefficients belonging to the Galois field. By using methods of the number theory, conditions are established for the divisibility of polynomials of a certain type by one another. A basic theorem is then proved from which four theorems of special cases of irreducible polynomials are derived. Orig. art. has: no figures, 6 equations.

ASSOCIATION: Institut avtomatiki i telemekhaniki (Institute of Automation and

Card 1/2



NO REF SOV: 001

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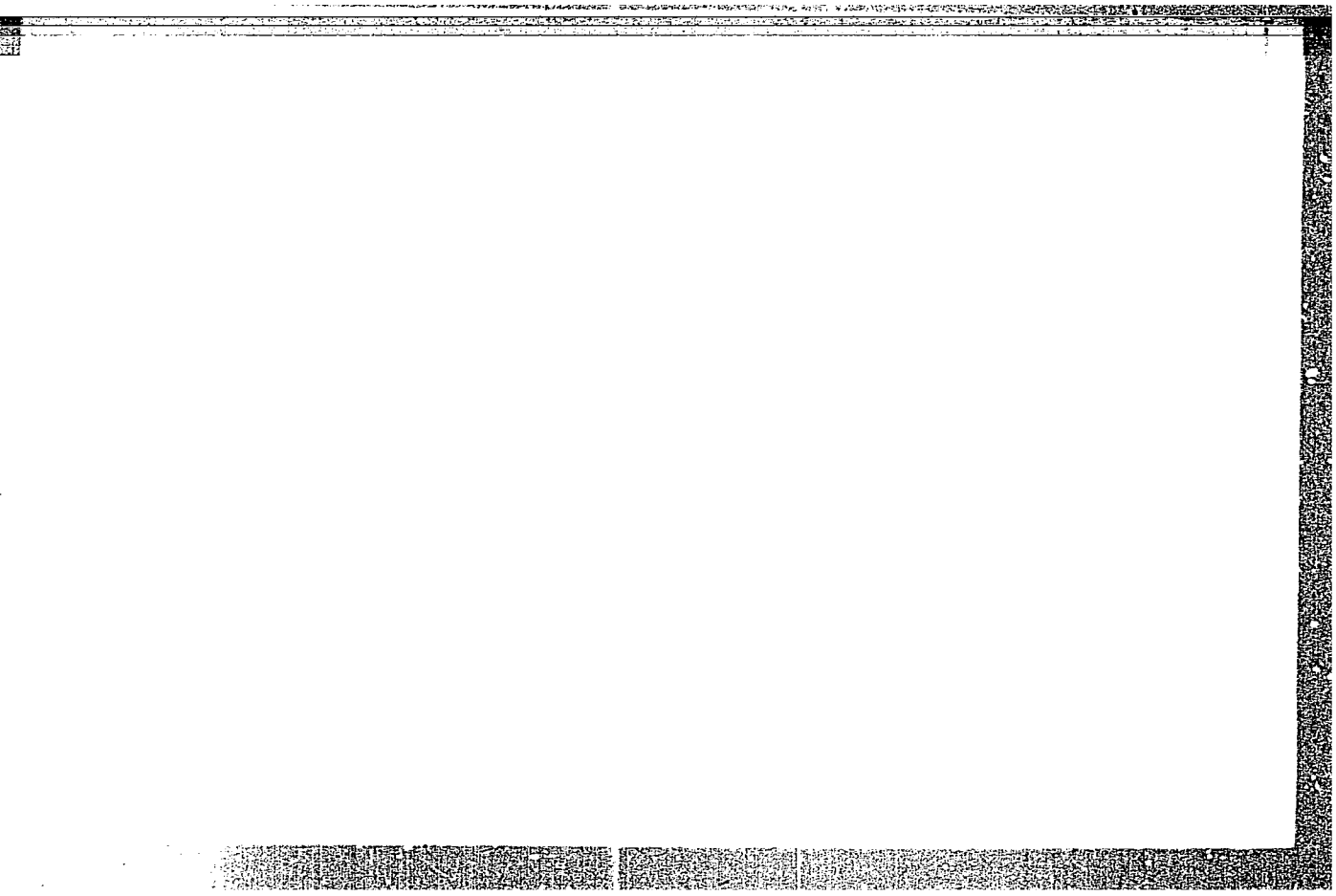
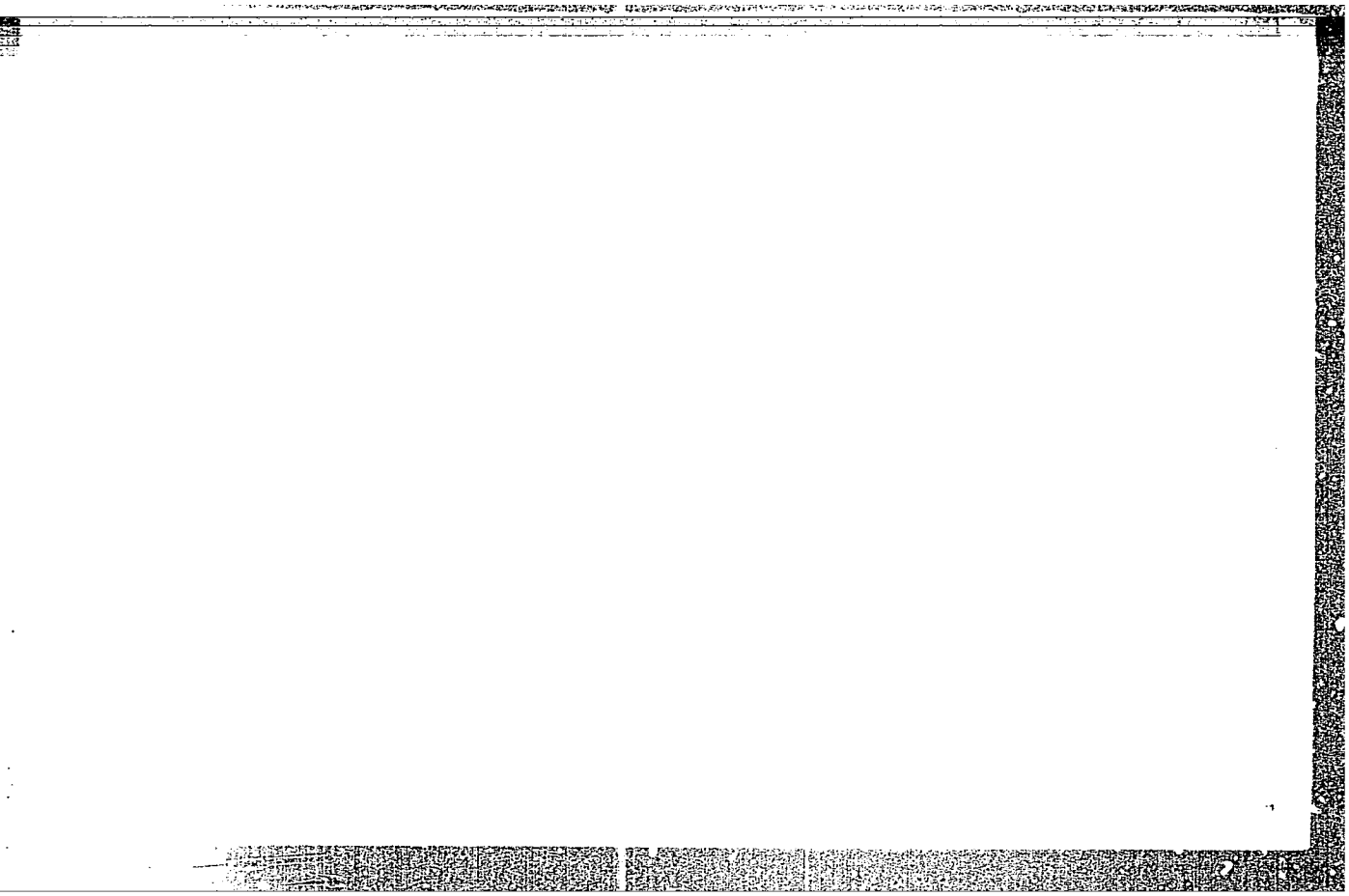
OTHER: 000



APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000927410007-1"



APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000927410007-1"

L 2967-66 EWT(d)/EWP(k)/EWP(l) JKT
ACCESSION NR: AP5026357 UR/0105/64/000/009/0093/0094

AUTHOR: Baluyev, V. K.; Grudinskiy, P. G.; Izyumov, N. M.; Kulebakin, V. S.; Mirolyubov, N. N.; Botnkov, B. O.; Tulin, A. D.; Alekseyev, A. Ye.; Bogoroditskiy, N. P.; Berger, A. Ya.; Yavorskiy, V. N.; Nasledov, D. N.; Vasil'yev, D. V.

TITLE: Nikolay Nikolayevich Lutsenko (Obituary)

SOURCE: Elektrichestvo, no. 9, 1964, 93-94

TOPIC TAGS: electric engineering personnel

ABSTRACT: Doctor of Technical Sciences, Major General in the Technical Engineering Service, Professor N. N. Lutsenko died in May of this year after a long and serious illness. He graduated from the Moscow Higher Technical Academy in 1914 and was closely associated with his specialty of electrical engineering till the end of his life. He spent the first years of his practical activity at the Academy working in the electrical engineering laboratory of K. A. Krug. After that he began his career in the Soviet Army as a lowly laboratory assistant in the radiotechnical laboratory and worked his way up over thirty years to be head of the

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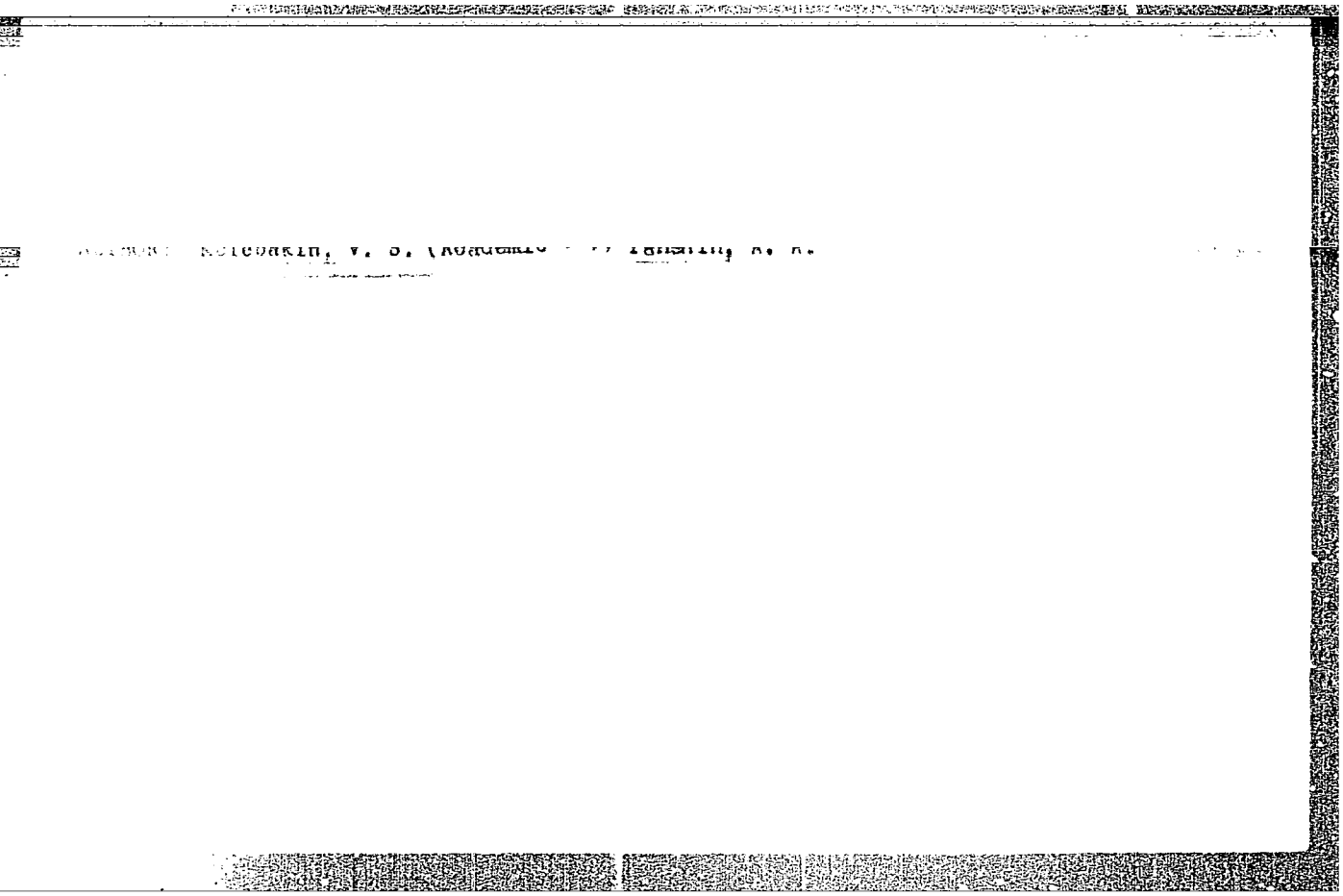
L 2967-66
ACCESSION NR: AP5026357

Department of Electrical and Military Engineering. He wrote several books: "Alternating Currents," "The Theory of Alternating Currents," "Course in General Electrical Engineering," "Radio Engineering" and, together with his co-workers, problem books on "A Course in Alternating Currents" and "The Physical Principles of Electrical Engineering." He set up a number of special courses (military application of electric power, military portable electric power stations, electric equipment for armies, electrification of military engineering works, etc.) and also participated in many engineering projects with the Soviet Army. He has written many textbooks, monographs and articles on the theoretical and applied divisions of military electrical engineering. These include "Electric Circuits" and "Fundamentals for the Design and Planning of Mobile Electric Stations." Many of N. N. Lutsenko's students are working in sections of the Soviet Army, in scientific institutes and in colleges, and in industry. These students are continuing the work of their teacher, the founder of Soviet military electrical engineering. He received his professorship in 1938 and his doctorate in 1949. He has received the Order of Lenin, three "Red Banners," the Order of the "Red Star" and many medals. Orig. art. has: 1 figure.

ASSOCIATION: none
SUBMITTED: 00 ENCL: 00 SUB CODE: EE
NO REF SOV: 000 OTHER: 000 JPRS

Card 2/2 lch



L 11548-66 EWT(d)/EWP(k)/EWP(1) JT

ACC NR: AP6005028 SOURCE CODE: UR/0105/65/000/001/0091/0091

AUTHOR: Ayvaz'yan, V. G.; Aleksandrov, B. K.; Andrianov, V. N.; Beschinskiy, A. A.; Budzko, I. A.; Zhimerin, D. G.; Krasnov, V. S.; Kruzhilin, G. N.; Kulebakin, V. S.; Listov, P. N.; Markvardt, K. G.; Markovich, I. M.; Popkov, V. I.; Styrikovich, M. A.

ORG: none

TITLE: Professor Andrey Georgiyevich Zakharin

SOURCE: Elektrichestvo, no. 1, 1965, 91

TOPIC TAGS: electric power engineering, electric engineering personnel

ABSTRACT: A short biography of subject on the occasion of his 60th birthday in November 64. A close disciple of Krzhizhanovskiy, he now heads sector of general methodological problems and forecasting at ENIN (Institute of Power Engineering imeni Krzhizhanovskiy), and power engineering section within its scientific council. In 1927-1932, worked in designing and construction of power stations and industrial power installations in the Trans-Caucasus. In 1932, having graduated as electrical engineer from Tbilisi Polytechnical Institute, he switched to scientific work at All-Union Institute of Farm Electrification, and at ENIN since 1944. Became candidate of technical sciences in 1937; doctor, in 1948. Subject is credited with working out the methods for designing efficient and economical regional and local power systems, utilizing local power resources and coordinating them with the power grids. He participated in studies on electrification through 1980, and on

Card 1/2 UDC: 621.31:(0,75.5)

L 11548-66

ACC NR: AF6005028

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the application of mathematical methods to solution of problems concerning fuel-power balance. In recent years, he has been concerned with linear programming, and long-term prediction with computer techniques. He authored about 80 scientific works, including monographs, textbooks and handbooks, and has been editing all ENIM publications. Is active in CEMA commissions and GOSPLAN USSR, devoting special attention to coordination of scientific research in power engineering. Has been awarded the Order of the Badge of Merit and other decorations. Orig. art. has: 1 figure.
[JPRS] 14

SUB CODE: 09 / SUBM DATE: none

HW
Card 2/2

L 10997-66
ACC NR: AP6001978 SOURCE CODE: UR/0105/65/000/003/0090/0091

AUTHOR: Neporozhniy, P. S.; Finogenov, Ya. I.; Lavrenenko, K. D.; Veselov, N. D.; Savinykh, A. I.; Sapozhnikov, F. V.; Serdyukov, N. P.; Chuprakov, N. M.; Nekrasov, A. M.; Borovoy, A. A.; Kotilevskiy, D. G.; Steklov, V. Yu.; Kulebakin, V. S.; Bogdanov, N. P.

14
23

ORG: none

TITLE: Petr Ivanovich Voyevodin

SOURCE: Elektrichestvo, no. 3, 1965, 90-91

TOPIC TAGS: electric engineering personnel, political personnel

ABSTRACT: P. I. VOYEVODIN died on 25 November 1964; one of the oldest Bolshevik-Leninists, he was a member of the CPSU already in 1899. He fought in the early battles of the revolution, was imprisoned and sent to Siberia in 1905. After the October Revolution he became an economic adviser to Lenin on matters pertaining to Siberia and the entire Soviet Union as well. He was active in planning and organizing GOELRO. In 1921 he was assigned to set up the new Russian cinema industry, later he turned to the problems of electrification: spreading Lenin's ideas, publishing books and periodicals on the subject. He was the first Soviet editor of "Elektrichestvo" and then the editor of "Elektrifikatsiya." He partici-

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L 10997-66

ACC NR: AP6001978

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pated in the International Power Conferences in Berlin 1930 and in Belgrade 1956. His entire life was devoted to faithful service in the interests of the Communist Party; in 1964 he was duly awarded the Order of Lenin and was named a Hero of Socialist Labor. Orig. art. has: 1 figure. [JPRS]

SUB CODE: 05, 09 / SUBM DATE: none

OC

Card 2/2

VERSHININ, V.D. (Moskva); KULEBAKIN, V.S. (Moskva)

Synthesis of linear invariant automatic control systems. Avtom. i telem. 26 no.1:42-49 Ja '65. (MIRA 18:4)

SOV/137-58-7-16158

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 319 (USSR)

AUTHORS: Kulebakina, V. V., Savel'yeva, Ye. I.

TITLE: Complete Chromatographic Separation of Tartrates of Cobalt and Nickel (Polnoye khromatograficheskoye razdeleniye tartratnykh kompleksov kobal'ta i nikelya)

PERIODICAL: Nauchn. raboty stud. Mosk. farmatsevt. in-ta, 1957, Nr 1, pp 143-148

ABSTRACT: The experiments are carried out with mixtures of 0.1 mol. eq. solutions of Ni and Co with the addition of a 0.2 mol. eq. solution of $NaHC_4H_4O_6$ to form compounds. A green band of Ni and a pink one of Co are obtained on the Al_2O_3 adsorber. The Co band can be completely washed out with 0.1-N HCl. Tables of the results of the experiments are adduced.

1. Cobalt--Processing 2. Nickel--Processing P. K.
3. Chromatographic analysis--Applications

Card 1/1

SHEMYAKIN, F.M.; KULEBAKINA, V.V.

Study of the conditions for obtaining precipitation chromatograms in gelatin gels and capillary tubes. Izv.vys.ucheb.zav.;khim.i khim.tekn. 6 no.1:35-43 '63. (MIRA 16:6)

1. Pervyy moskovskiy meditsinskiy institut imeni Sechenova, kafedra analiticheskoy khimii.
(Chromatographic analysis) (Gelatin)

KULEBYAKIN, A.; SHPAYER, R.

Training of builders. Prof. -tekh.obr. 11 no.1:31 '54. (MLRA 7:6)
(Technical education)

KULEBAYEV, V. G.

Agronomist

DECEASED
May 63

1963/4

KULEBYAKIN, A.

Butter - Analysis and Examination

Research on keeping qualities of sour cream butter, Mol. prom. 13, No. 3, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1953, Uncl.

GOMON, G.O.; KINZHALOV, P.S.; KULEBYAKIN, N.M.

Luminescence of diamonds from the "Mir" pipe. Geol.i geofiz. no.2:116-118 '62. (MIRA 15:4)

1. Trest "Yakutalmaz", pos. Mirnyy.
(Yakutia—Diamonds)

FESENKO, S.; STARENCHENKO, P.; KULEBYAKIN, Yu., inzh.

Exchange of experience. Avt.transp. 42 no. 4:51-52 Ap '64.
(MIRA 17:5)

KULEBYAYEV, V.G.

Changing the appearance of the cotton bush of the Gossypium barbadense L. type. Agrobiologiia no. 3:404-408 My-Je '64. (MIRA 17:7)

1. Iolotanskaya selektsionnaya stantsiya, Turkmenskaya SSR.

SOV/112-57-9-18897

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 9, p 128 (USSR)

AUTHOR: Kulefeyev, G. P.

TITLE: Rural Electrification in Austria (Ob elektrifikatsii sel'skogo khozyaystva Avstrii)

PERIODICAL: Sb. tekhn. inf. po sel'sk. elektrif., 1956, Nr 2, pp 40-47

ABSTRACT: In the report of a business trip to Austria of a Soviet delegation in 1955, it is stated that a dense network of electrical transmission lines in Austria enabled the Austrians to electrify about 400,000 or 93% of the total amount of 433,000 farms. 264,000 electric motors are used in agriculture, of which 27,000 have a capacity under 1 kw, 210,000 of 1-5 kw, and 27,000 are over 5 kw. Thus, each farm has 0.6 motor on the average. Near Linz, in the best Obermeyer (Upper Austria) farm, which tills 40 ha and has 25 cows, there are 17 electric motors with a total capacity of 85 kw. In addition, the farm has a tile electric space heater and electric range installed in the apartment, an electric fence, and a portable truck-mounted electric motor. In 1954, this farm consumed 15,000 kwh, or 375 kwh per hectare. All electric generating stations in Austria including small ones are connected to electric power systems.

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SOV/112-57-9-18897

Rural Electrification in Austria

Agricultural customers are supplied from the power system via wooden-pole transformers of up to 100 kva, 20/0.4 kv. For substations over 100 kva, brick transformer vaults are built. Electric transmission lines of up to 20 kv have partially-treated wooden poles. Over the last few years, full antiseptic treatment of poles and reinforced concrete stubs have begun to be used. "Piccolo" stubs 2.6 and 3.2 m long, weighing 130-215 kg, are the most widely used; they require 16 kg of st.40 steel and about 25 kg of cement each. A drawing of a stub is presented, as well as the method of securing it to the pole, and also a brief description of pole-treatment processing by the method of sap displacement. Machinery and instruments that were exhibited at the Vienna Fair are described: (1) an electric fence of three types, 6-v, 9-v battery, and 220-v supply line with a control lamp; (2) an electric machine for cleaning animals; (3) a vacuum scraper apparatus without friction parts, 42 v, 100 w; (4) a gasoline motor-driven milking outfit for 1-2 milkers; (5) equipment for a fully mechanized cattle yard enabling one to clean a 20-head cow shed in five minutes, etc.

I.V.I.

Card 2/2

KULEFEYEV, G.P.

Electrification of agriculture in the Soviet Union. Politekh. obuch. no.4:56-61 Ap '58. (MIRA 11:3)
(Rural electrification)

8(6) SOV/112-59-5-8769

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 5, p 49 (USSR)

AUTHOR: Kulefeyev, G. P.

TITLE: Present State of Rural Electrification, Prospects of Its Development, and Objectives in Improving Operation of Electric Networks and Substations

PERIODICAL: Sb. tekhn. inform. po sel'sk. elektrifik., 1958, Nr 8-9, pp 14-36

ABSTRACT: Rural electrification in the USSR was characterized by the following data as of the beginning of 1957: 95% of sovkhozes and 32% of kolkhozes were electrified. By the end of 1960, 50-55% of kolkhozes are expected to be electrified. The average generating capacity per one kolkhoz is about 50 kw and per one machine-tractor station about 90 kw. The number of electric motors used in agriculture was 560,000. The total length of electric lines was 370,000 km, 140,000 km being high-voltage lines. Electric-energy consumption by agriculture, including household needs and lighting, was 5 billion kwh in 1956. According to the plan of agricultural electrification for the next 10-15 years developed by Giprosel'elektro, the electric-energy

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SOV/112-59-5-8769

Present State of Rural Electrification, Prospects of Its Development, and . . . .

requirements, including those for complex mechanization, will reach 50 billion kwh (20 billion kwh being allotted for kolkhozes) in 1970. To materialize this plan, a highly centralized power supply is needed. The total generating capacity is planned to be 12-13 million kw; 80% of them are expected to come from large power systems, 15% from rural hydroelectric stations, and the balance (about 500,000 kw, including heat reserve) is expected to come from newly built heating-power stations, mostly diesel-powered. Investment in the above plan, excluding new generating capacities in large power systems, will amount to about 50 billion rubles. The following structures are planned: 3,500-4,000 35/10-kv substations, 140,000 km 35-kv transmission lines, one million km of 6-10-kv lines, and one million km of low-voltage lines. The total installed transformer capacity is expected to reach 30 million kva. Shortcomings in power supply and in operation of networks and installations are noted. See also SOV/112-59-5-8770.

I.S.Sh.

Card 2/2

KULEFEYEV, G.P.

Review of rural electrification in Europe. Mekh. i elek. sets. sel'khoz. 17 no.1:51-54 '59. (MIRA 12:1)

1.Nachal'nik Glavnogo upravleniya sel'skikh elektrostantsiy Ministerstva sel'skogo khozyaystva SSSR.
(Europe--Rural electrification)